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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/768,633	01/24/2001	Shota Iwasaki	NECN 18.280	3961

7590 04/08/2003

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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 04/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/768,633

Applicant(s)

IWASAKI ET AL.

Examiner

Ishwar (I. B.) Patel

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) 4-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Tetsuo Mochizuki et al., Japanese Patent JP409181445A, hereafter Tetsuo.

Tetsuo disclose a circuit board comprising a base member (glass epoxy insulation board 11, see figure 1 (c)),

an interconnect layer formed on a part of the base member (wiring pattern 12, see figure 1 (c)),

an electrically-floating conductive layer formed on a substantially remaining part of the base member and having an edge adjacent to an edge of the interconnect layer (dummy pattern 13, see figure 1 (c)), and

a dielectric layer covering a part of the interconnect layer and a entire surface of the electrically floating conductive layer and filling a gap between the edge of the interconnect layer and the edge of the electrically floating conductive layer (insulating rein 14, see figure 1 (c)).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tetsuo Mochizuki et al., Japanese Patent JP409181445A, hereafter Tetsuo, as applied to claim 1 above, and further in view of Hideo Takada, Japanese Publication 07-263871.

Regarding claim 2, though Tetsuo does not disclose the interconnect layer on other side of the base member.

However, double sided circuit boards or multilayer circuit boards, as disclosed by Takada, are known in the art and used for increasing the component density or for installing component on one surface and connecting the other surface to another board.

Takada discloses a circuit board with ground pattern 12 on both the sides of the circuit board for EMI shielding.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Tetsuo with the circuit pattern on both the side of the base member, as taught by Takada, to increase the component density of the board.

Regarding claim 3, though the modified circuit board of Tetsuo does not disclose the volume of interconnect layer same on both sides, it depend upon relative thermal co-efficient of expansion of the conductive material, the insulating material, the component or any other circuit board to be connected, to balance the total expansion-contraction within limits to avoid stress / strain and even breakage of the circuit. If the conductive material on both side of the base member is equal, it will be inherently easy to control such expansion / contraction. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Tetsuo with volume of interconnect layers on both the side substantially same in order to better control the expansion / contraction of the system to avoid crack and to get a better performance.

Response to Arguments

5. Applicant's arguments with respect to claims 1-3 have been considered but not found persuasive.

Regarding claim 1, the applicant's argument is about the object of the invention of the present invention and that of the applied prior art, the present invention is to prevent the generation of crack, whereas that of the applied prior art is to prevent peeling of circuit board.

However, the prior art is applied based on the disclosed structure and not on the object. The conductive layer may even be applied for shielding or grounding as disclosed by Takada.

Further, hermetic shielding is known with shielding from top, bottom and sides for protection from environment and can be provided depending upon the specific requirement.

Regarding claim 2, though new art is applied, double sided circuit board or multilayer circuit boards are known in the art for increasing the component density and for increasing the flexibility of routing the traces in the board and can be provided based on specific requirements.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Crepeau discloses a circuit board with a conductive material layer 62 on the surface with the opening for the contact pads; see figure 3 and 4, column 5, line 33-47.

Marx et al., discloses a circuit board with top, bottom and sides surfaces covered with ground planes.

Harada et al., discloses power layer 109 and 110 on both side of the circuit board, prior art figure 2.

Higgins, Jr. discloses multilayer board with ground planes 208 and 218 on top and bottom surface of the board, see figure 2, with a metal housing 104.

Urasaki et al., Shirasaki et al., and Yoneda disclose circuit boards with top surface covered with insulating material except the contact regions.

Takeshi disclose top surface with ground pattern 16, see figure 1.

Application/Control Number: 09/768,633
Art Unit: 2827

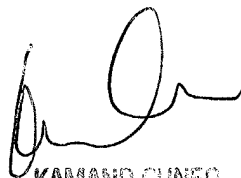
Page 6

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (8:30 - 5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
March 28, 2003



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